PROBLEM SYMPTOMS TABLE

HINT:

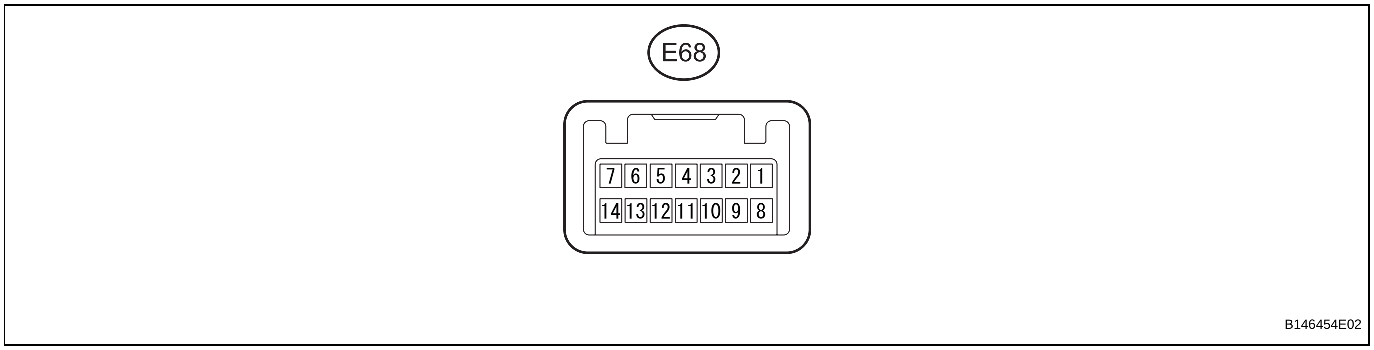
Use the table below to help determine the cause of the problem symptom. The potential cases of the symptoms are listed in order of probability in the "Suspected Area" column of the table. Check each symptom by checking the suspected area in the order they are listed. Replace parts as necessary.

ENGINE IMMOBILISER SYSTEM

Symptom	Suspected Area	See page
Engine does not start	1. Key	EI-25
	2. ID code box power source circuit	EI-49
	3. Certification ECU power source circuit	EI-51
	4. Steering lock ECU power source circuit	SR-74
	5. Smart access system with push button start	ST-15
	6. SFI system	ES-10

TERMINALS OF ECU

1. CHECK ENGINE SWITCH



(a) Disconnect the E68 switch connector.

(b) Measure the resistance according to the value(s) in the table below.

Symbols (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
AGND (E68-8) - Body ground	V - Body ground	Ground	Always	Below 1 Ω

If the result is not as specified, there may be a malfunction on the wire harness side.

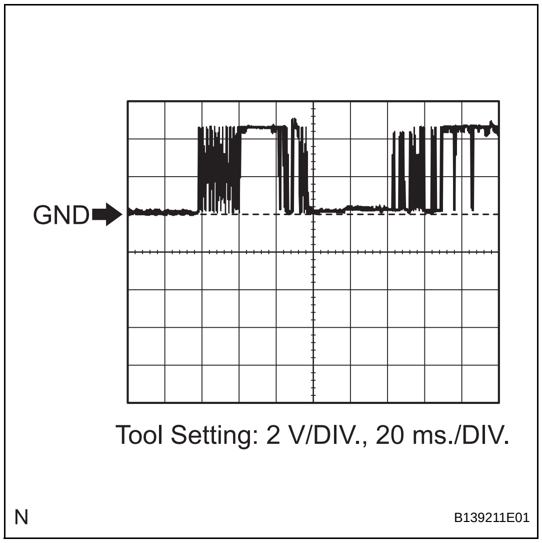
(c) Reconnect the E68 switch connector.

(d) Measure the resistance and voltage according to the value(s) in the table below.

Symbols (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
AGND (E68-8) - Body ground	V - Body ground	Ground	Always	Below 1 Ω
VC5 (E68-14) - AGND (E68-8)	O - V	Power supply	Key is not in cabin	Below 1 V
			Press engine switch	4.6 to 5.4 V
CODE (E68-10) - AGND (E68-8)	W - V	Demodulated signal of key code data	Key is not in cabin	Below 1 V
			Press engine switch and hold key close to engine switch*	Pulse generation (see waveform 1)
TXCT (E68-9) - AGND (E68-8)	GR - V	Key code output signal	Key is not in cabin	Below 1 V
			Press engine switch and hold key close to engine switch*	Pulse generation (see waveform 2)

HINT:
*: Remove the key battery before performing this inspection.

If the result is not as specified, the switch may have a malfunction.



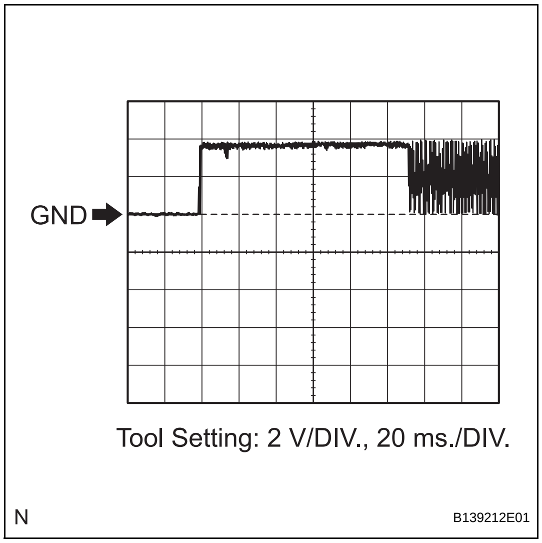
(e) Inspect using an oscilloscope.

(1) Waveform 1 (Reference)

Item	Content
Symbols (Terminal No.)	CODE (E68-10) - AGND (E68-8)
Tool Setting	2 V/DIV., 20 ms./DIV.
Condition	Press engine switch and hold key close to engine switch*

HINT:

*: Remove the key battery before performing this inspection.



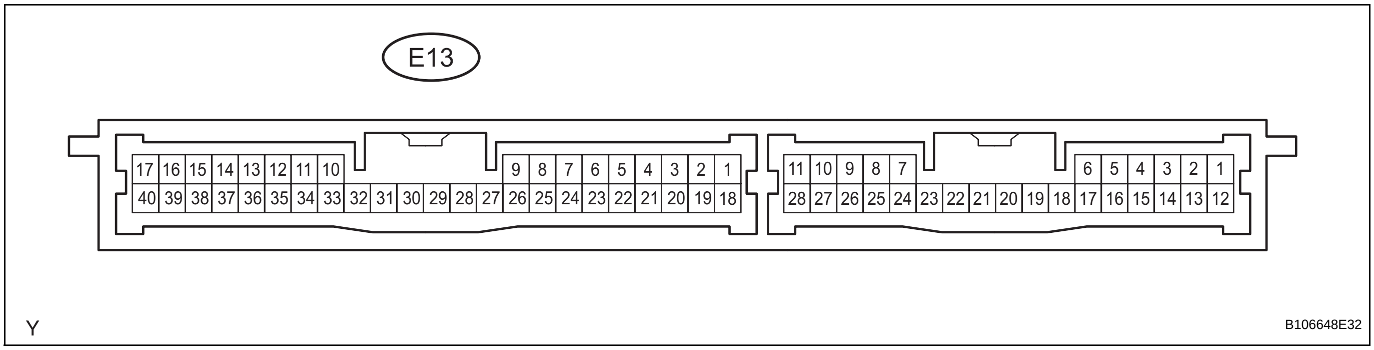
(2) Waveform 2 (Reference)

Item	Content
Symbols (Terminal No.)	TXCT (E68-9) - AGND (E68-8)
Tool Setting	2 V/DIV., 20 ms./DIV.
Condition	Press engine switch and hold key close to engine switch*

HINT:

*: Remove the key battery before performing this inspection.

2. CHECK CERTIFICATION ECU



(a) Disconnect the E13 ECU connector.

(b) Measure the resistance and voltage according to the value(s) in the table below.

Symbols (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
E (E13-17) - Body ground	W-B - Body ground	Ground	Always	Below 1 Ω
+B1 (E13-1) - E (E13-17)	W - W-B	+B power supply	Always	10 to 14 V
IG (E13-18) - E (E13-17)	B - W-B	Ignition power supply	Power switch off	Below 1 V

If the result is not as specified, there may be a malfunction on the wire harness side.

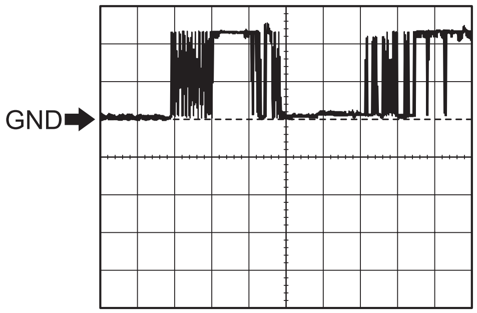
(c) Reconnect the E13 ECU connector.

(d) Measure the resistance and voltage according to the value(s) in the table below.

Symbols (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
AGND (E13-40) - Body ground	V - Body ground	Power switch ground	Always	Below 1 Ω
VC5 (E13-30) - AGND (E13-40)	O - V	Power switch power supply	Key is not in cabin	Below 1 V
			Press engine switch*	4.6 to 5.4 V
CODE (E13-9) - AGND (E13-40)	W - V	Power switch CODE input	Key is not in cabin	Below 1 V
			Press engine switch and hold key close to engine switch*	Pulse generation (see waveform 1)
TXCT (E13-8) - AGND (E13-40)	GR - V	Power switch TXCT output	Key is not in cabin	Below 1 V
			Press engine switch and hold key close to engine switch*	Pulse generation (see waveform 2)

HINT:
*: Remove the key battery before performing this inspection.
If the result is not as specified, the ECU may have a malfunction.

(e) Inspect using an oscilloscope.
(1) Waveform 1 (Reference)

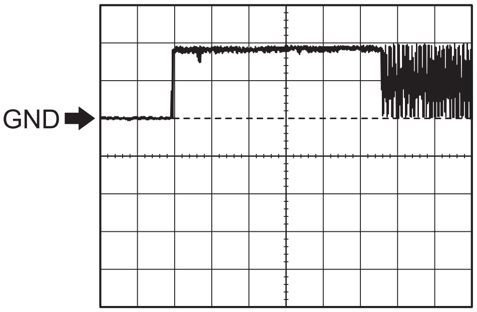


Tool Setting: 2 V/DIV., 20 ms./DIV.

Item	Content
Symbols (Terminal No.)	CODE (E13-9) - AGND (E13-40)
Tool Setting	2 V/DIV., 20 ms./DIV.
Condition	Press engine switch and hold key close to engine switch*

HINT:
*: Remove the key battery before performing this inspection.

(2) Waveform 2 (Reference)

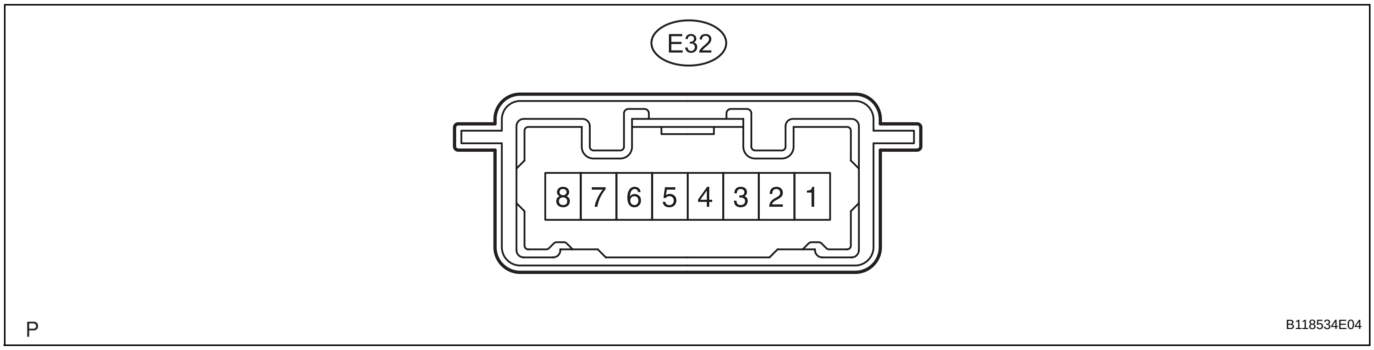


Tool Setting: 2 V/DIV., 20 ms./DIV.

Item	Content
Symbols (Terminal No.)	TXCT (E13-8) - AGND (E13-40)
Tool Setting	2 V/DIV., 20 ms./DIV.
Condition	Press engine switch and hold key close to engine switch*

HINT:
*: Remove the key battery before performing this inspection.

3. CHECK ID CODE BOX



(a) Disconnect the E32 ECU connector.

(b) Measure the resistance and voltage according to the value(s) in the table below.

Symbols (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
GND (E32-8) - Body ground	W-B - Body ground	Ground	Always	Below 1 Ω
+B (E32-1) - GND (E32-8)	W - W-B	+B power supply	Always	10 to 14 V

If the result is not as specified, there may be a malfunction on the wire harness side.

(c) Reconnect the E32 ECU connector.

(d) Measure the voltage according to the value(s) in the table below.

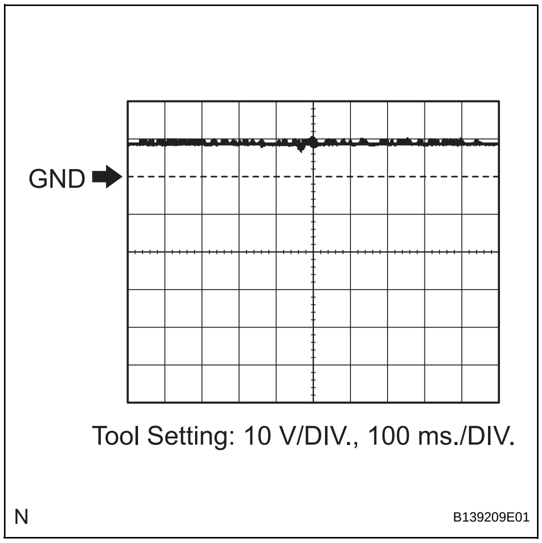
Symbols (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
EFII (E32-5) - GND (E32-8)	BR - W-B	ECM input signal	Engine switch off	Below 1 V
			Engine switch on (IG)	Pulse generation (see waveform 1)
EFIO (E32-6) - GND (E32-8)	L - W-B	ECM output signal	Engine switch off	Below 1 V
			Engine switch on (IG)	Pulse generation (see waveform 2)

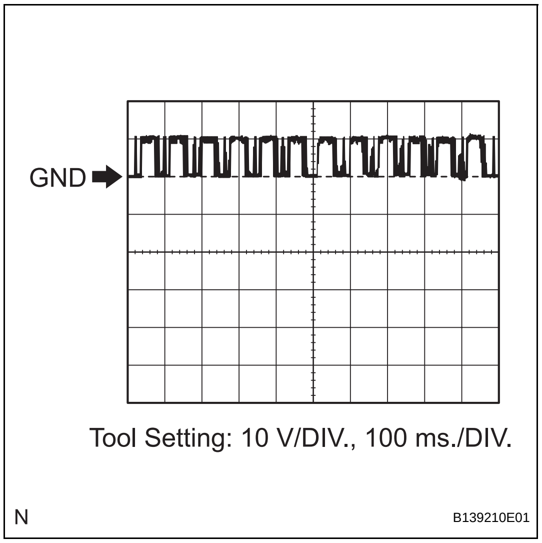
If the result is not as specified, the ECU may have a malfunction.

(e) Inspect using an oscilloscope.

(1) Waveform 1 (Reference)

Item	Content
Symbols (Terminal No.)	EFII (E32-5) - GND (E32-8)
Tool Setting	10 V/DIV., 100 ms./DIV.
Condition	Engine switch on (IG)

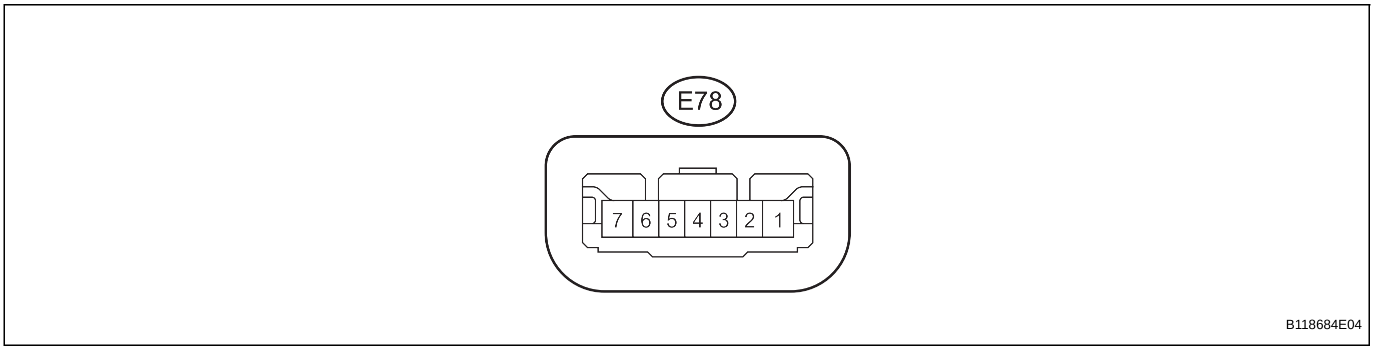




(2) Waveform 2 (Reference)

Item	Content
Symbols (Terminal No.)	EFIO (E32-6) - GND (E32-8)
Tool Setting	10 V/DIV., 100 ms./DIV.
Condition	Engine switch on (IG)

4. CHECK STEERING CONTROL ECU

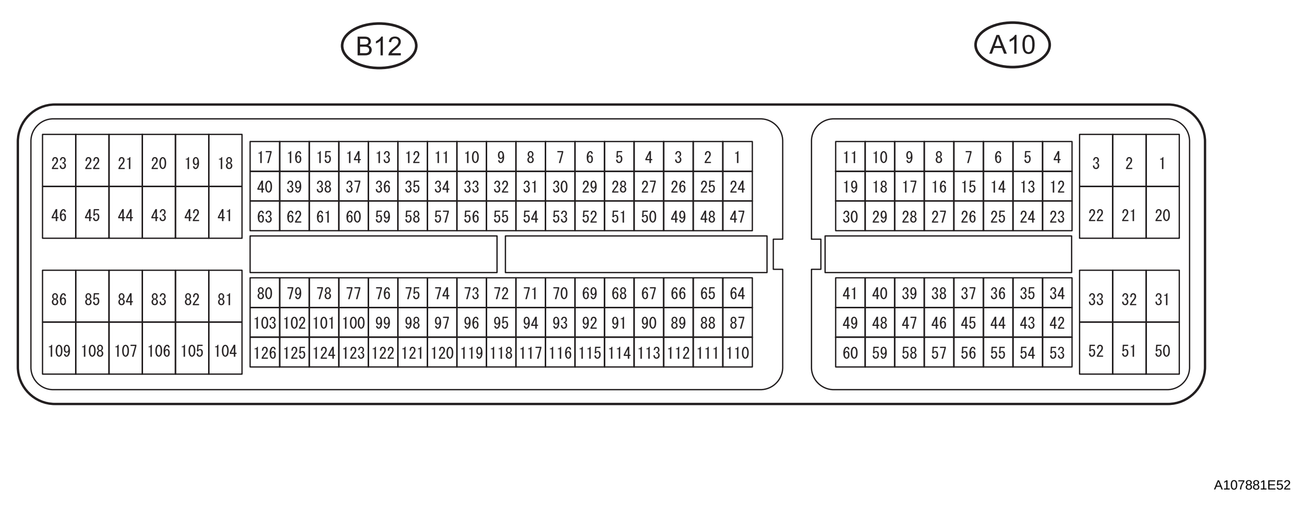


(a) Disconnect the E78 ECU connector.
(b) Measure the resistance and voltage according to the value(s) in the table below.

Symbols (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
SGND (E78-2) - Body ground	W-B - Body ground	Ground	Always	Below 1 Ω
GND (E78-1) - Body ground	W-B - Body ground	Ground	Always	Below 1 Ω
B (E78-7) - Body ground	B - Body ground	+B power supply	Always	10 to 14 V
IG2 (E78-6) - Body ground	B - Body ground	Ignition power supply	Engine switch off	0 V
			Engine switch on (IG)	10 to 14 V

If the result is not as specified, there may be a malfunction on the wire harness side.

5. CHECK ECM



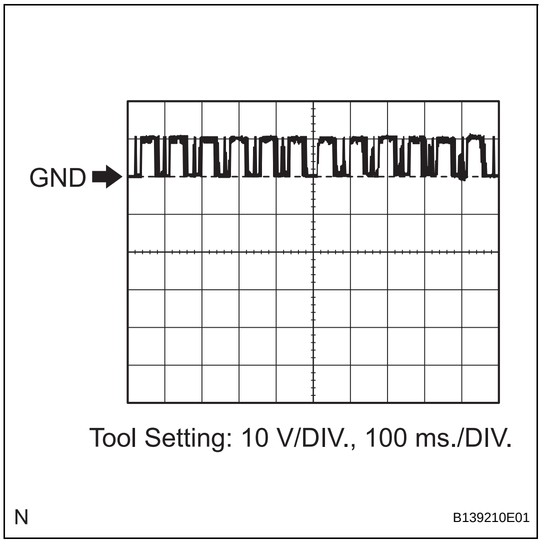
(a) Measure the resistance and voltage according to the value(s) in the table below.

Symbols (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
E1 (B12-81) - Body ground	W-B - Body ground	Ground	Always	Below 1 Ω
E01 (B12-22) - Body ground	W-B - Body ground	Ground	Always	Below 1 Ω
E02 (B12-21) - Body ground	B-W - Body ground	Ground	Always	Below 1 Ω
E03 (B12-104) - Body ground	B - Body ground	Ground	Always	Below 1 Ω
E04 (B12-23) - Body ground	W - Body ground	Ground	Always	Below 1 Ω
E05 (B12-46) - Body ground	W - Body ground	Ground	Always	Below 1 Ω
ME01 (B12-20) - Body ground	B - Body ground	Ground	Always	Below 1 Ω
BATT (A10-20) - E1 (B12-81)	Y - W-B	Battery (for measuring battery voltage and for ECM memory)	Always	10 to 14 V
+B (A10-2) - E1 (B12-81)	R - W-B	Power source of ECM	Engine switch off	Below 1 V
			Engine switch on (IG)	10 to 14 V
+B2 (A10-1) - E1 (B12-81)	R - W-B	Power source of ECM	Engine switch off	Below 1 V
			Engine switch on (IG)	10 to 14 V
IMI (A10-11) - E1 (B12-81)	Y - W-B	Immobiliser code ECU input signal	Engine switch off	Below 1 V
			Engine switch on (IG)	Pulse generation (see waveform 1)
IMO (A10-10) - E1 (B12-81)	G - W-B	Immobiliser code ECU output signal	Engine switch off	Below 1 V
			Engine switch on (IG)	Pulse generation (see waveform 2)

If the result is not as specified, the ECM may have a malfunction.

(b) Inspect using an oscilloscope.

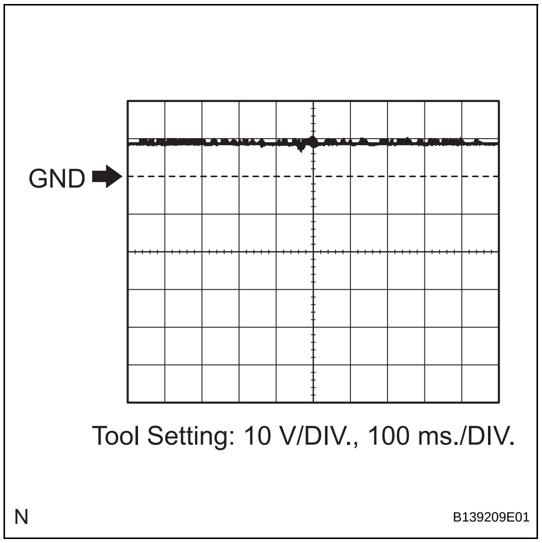
(1) Waveform 1 (Reference)



Tool Setting: 10 V/DIV., 100 ms./DIV.

Item	Content
Symbols (Terminal No.)	IMI (A10-11) - E1 (B12-81)
Tool Setting	10 V/DIV., 100 ms./DIV.
Condition	Engine switch on (IG)

(2) Waveform 2 (Reference)



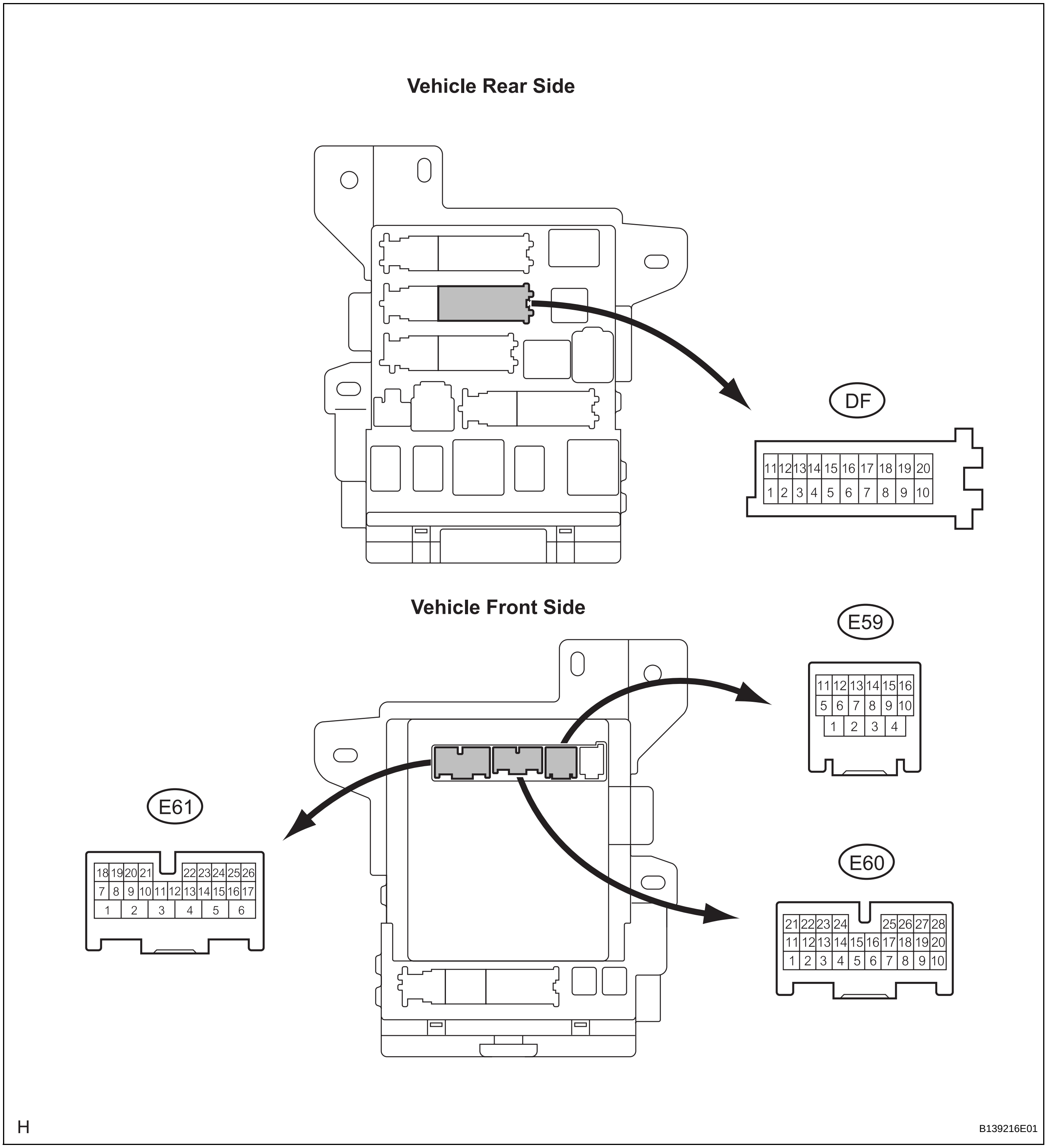
Tool Setting: 10 V/DIV., 100 ms./DIV.

Item	Content
Symbols (Terminal No.)	IMO (A10-10) - E1 (B12-81)
Tool Setting	10 V/DIV., 100 ms./DIV.
Condition	Engine switch on (IG)

6. CHECK MAIN BODY ECU (INSTRUMENT PANEL J/B)

(a) Disconnect the DF junction block connectors.

(b) Disconnect the E59, E61 and E60 main body ECU connectors.



(c) Measure the resistance and voltage according to the value(s) in the table below.

Symbols (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
GND1 (DF-10) - Body ground	W-B - Body ground	Ground	Always	Below 1 Ω
GND3 (E59-1) - Body ground	W-B - Body ground	Ground	Always	Below 1 Ω
AM1 (E61-6) - Body ground	L - Body ground	+B power supply	Always	10 to 14 V
AM2 (E60-1) - Body ground	L - Body ground	+B power supply	Always	10 to 14 V